New Public Transit System for Accra, Ghana

Cornelius Nuworsoo
Ph.D., AICP
Assistant Professor,
City and Regional Planning, Cal Poly

Cornelius Nuworsoo joined the CRP department in 2005 and specializes in transportation planning. He developed the full concept for a city-wide rapid transit system for Accra, capital city of Ghana. The system was adopted by government officials and the World Bank has recently approved a loan to the Government of Ghana for a demonstration program as the first step in plan implementation.

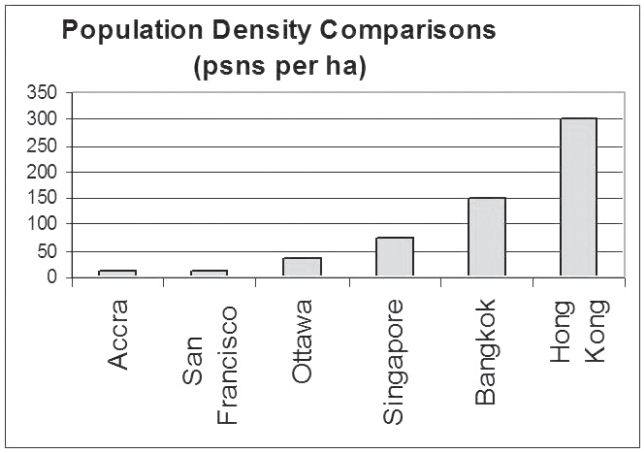
Like many developing cities of the world, Accra is faced with rapid motorization and increasing automobile use without commensurate development of roadway infrastructure. Mobility and accessibility are increasingly hindered as traffic flow, particularly during morning and evening commute hours, continues to deteriorate over the years. The situation is exacerbated by a limited, existing road network and lack of funds to expand the network at a rate commensurate with growth of the city and pace of motorization. Planners and government officials realized the need to find a solution before the City grinded to a halt. This realization prompted the search for feasible, sustainable and affordable solutions to mass transportation for Accra. The search led to the identification of Bus Rapid Transit (BRT) as the system with potential to satisfy the City's public transport needs.

BRT is a flexible, rubber-tired, public transportation mode designed to provide rapid transit services through an integrated system of Intelligent Transportation System (ITS) technologies that include priority treatments, dedicated or demarcated running ways, stations, vehicles and short service headways. Its advantages include the flexibility of the motorbus (a) to go off fixed routes for collection and distribution functions, and (b) the ease with which routes can be reconfigured along the street network to suit demand. BRT requires relatively low capital and operating costs compared to the rail-based transit modes. It can also be incrementally implemented as conditions in its service area change.

Background to the Study Location

Ghana is located on the West Coast of Africa (Figure 1). The country lays north of latitude 4 degrees north and is intersected by longitude 0 degrees, the Greenwich Meridian. Ghana is a former British Colony named the Gold Coast. Thus the official language of government is English although there are several local languages of which seven are officially used on radio. The country covers an area of 238,477 square-kilometers (or 93,000 square-miles) and is about the size of the state of Oregon.

Figures 1 & 2. The location of Ghana and Accra, and a comparative table of population densities in several world cities.



Ghana's population estimate for 2000 is 19 million people, of which 40% live in urbanized areas. Automobile ownership is relatively low at 60 autos per 1000 population, which is equivalent to 1/9th the US rate in 1995, or the rate where Greece was in 1975 or where the United Kingdom was in 1955.

Accra, the Capital City of Ghana, is situated on the southern coast, along the Gulf of Guinea. It is a Primate City spread over an area of 1,390 square-kilometers, which is the equivalent of two times the land area of either Singapore or the City of San Francisco. The metropolitan area boasts 25% of the urban population in the country, 50% of the national vehicle fleet and a density of approximately 1150 persons per square-kilometer (or 11.5 persons per hectare). See Figure 2 for a comparison of density in Accra with selected world cities. Falling on the low end of the density scale, it became apparent that rail transit systems that require very high densities may not be the appropriate investment in Accra. Figure 3 and Figure 4 show the streetscape along major thoroughfares in Accra. It is noticeable that physical development is predominantly low to mid-rise. This is consistent with its low development density.

Existing Transportation System

Public transportation is the dominant method of travel in Accra, and the nation as a whole. Nearly half of all trips to work are completed by one of many types of buses that operate like jitneys. This means they have no fixed schedules or stop locations although they may run specific origin to destination routes. Nearly 15% more of work trips are by taxis, which are shared-ride for which passengers pay per person per ride. A healthy 25% of work trips are conducted on foot. About 10% of commuters use private automobiles. Due to climate and lack of safe facilities, less than 3% of trips are by bicycle or motorcycle.

Large municipal buses have been unable to compete effectively for trips to the CBD of Accra due to high levels of delay and inability to maintain any semblance of a regular schedule. Thus the traffic stream comprises of multitudes of "jitney"-type public transportation vehicles intermingled with private automobiles, trucks and taxis. The lack of pullouts or designated stopping points for jitneys results in numerous interruptions to flow even within non-conflicting streams of traffic.

Planners and government officials realized the need to find a solution before the City grinded to a halt. This realization prompted the development of the BRT plan.

Philosophical Basis for the Plan

The development of the BRT plan was predicated on the following three premises:

1. Cities in developing countries have some of the worst congestion and mobility problems in the world. The negative effects of these on productivity cannot be over-emphasized.
2. Developing countries do not have the resources to embark on large-scale rail transit projects. BRT offers a relatively low-cost alternative for reasonably high

Figures 3 & 4. Streetscapes of Accra. A major thoroughfare towards the CBD showing the ocean in the background, and a major traffic circle on the way to the downtown.

person-carrying capacity and is generally known to offer the "best bang for the buck."

3. Cities of developing countries have either strong central city cores or concentrations of employment and commercial activities linearly along radial corridors. These conditions augur well for "mass" transit systems.

Previous studies of bus rapid transit systems (Cervero, 1986, 1998, 1999; Cornwell, 1990; Fouracre, 1994; Smith, 1998) note its advantages and indicate the following:

- Under appropriate regulation, organization and capital investment, bus-based transit systems are capable of transporting large volumes of passengers at reasonable speeds for relatively low capital and operational costs;
- A busway can provide equivalent capacity to light rail transit (LRT) at a fraction of the capital cost under comparable levels of guide-way segregation and station spacing.

Proponents of the BRT plan therefore saw the potential of BRT as a feasible and affordable form of mass transportation for Accra. It is anticipated that several benefits will accrue from its implementation to include the following:

1. The operational effectiveness of the Accra BRT system in a separate right-of-way will include:
   a. Speed advantages over mixed-mode operation;
   b. Flexible routing, entry and exit;
   c. Ease of incremental development.
2. The cost effectiveness of the Accra BRT system mainly from upgrading existing secondary roads will include:
   a. Relatively low cost investment;
   b. High local content in construction.

The Vision and the Plan

A vision statement for the BRT plan was articulated as follows: "A network of high capacity bus rapid transit routes

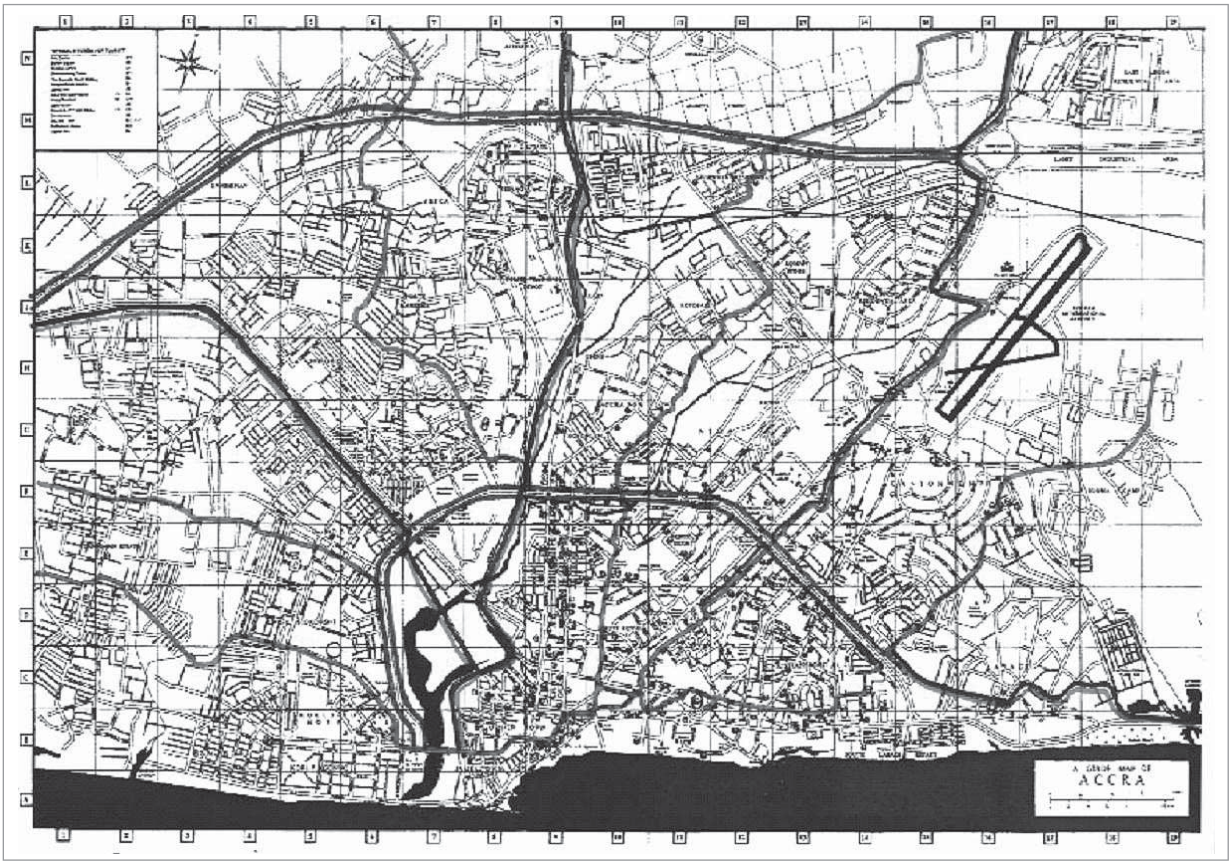


Figure 5. Proposed physical layout of the Accra BRT Plan.

that will provide opportunity for equal accessibility to all persons regardless of income or stature and enable sustainable growth and economic expansion of the capital city".

The BRT Plan comprehensively addresses many aspects of the BRT system. These include the physical layout, operational arrangements, legal and institutional requirements, and supporting policy changes in land use. See Figure 6 for the proposed physical layout of the BRT plan.

Conclusion

The government of Ghana has recently solicited proposals from firms worldwide to provide consultant services in the deployment of the first of the proposed BRT lines as a demonstration project. Although successful BRT operations exist in Brazil and Canada, the idea is to use local knowledge gained from the demonstration project in the design and implementation of the city-wide BRT plan. The consultant selection is underway at the time of this article.

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